

THE STATUS OF *HYLA IRRORATA* DE VIS 1884 (ANURA: HYLIDAE)

JEANETTE COVACEVICH
Queensland Museum

ABSTRACT

Opinions of the five authors who have commented on the status of *Hyla irrorata* are summarised and, following examination of the neotype and eleven specimens identified as *H. irrorata* by De Vis early in 1885, *H. irrorata* is synonymised with *Litoria caerulea* (White), 1790.

Hyla irrorata was described in a paper read on 8th August, 1884, from a series of specimens collected at Gympie in southeastern Queensland by Mr H. F. Wallman. In De Vis's original description the dorsum is described as 'lead blue to olive brown' (not or), and variation 'in young examples' is referred to (p. 129), so it seems reasonable to assume that De Vis had at least three specimens although only two sets of measurements are given in the description.

Eleven specimens (J12970–80) in the Queensland Museum collection were erroneously presumed to be De Vis's syntypes by Covacevich (1971, p. 53). These specimens were previously registered as collection 10, R 4826. Collection 10, in the 'Collection Register C1–C178 1884–1899' was made according to the register, by Mr H. F. Wallman in 1884 'during his geological investigations' at Gympie. The third entry in collection 10 is '*Hyla irrorata* De Vis 11'. The number R4826 accompanies this entry in different, apparently more recent, handwriting indicating registration of the eleven specimens in the 'General Catalogue 1887 (?)–1893 R1–R6219'. In this, R4826 refers to the same specimens—'*Hyla irrorata* De Vis 3, 8 Gympie'. This collection data agrees with that given by De Vis. Total lengths (= snout–vent length (S–V) after Tyler, 1968, p. 9) of these specimens are in mm:

J12870, 76·2; J12871, 54·8; J12872, 55·7; J12873, 69·2;
J12874, 52·5; J12875, 66·0; J12876, 72·3; J12877, 62·7;
J12878, 81·0; J12879, 72·7; J12880, 84·5.

The measurements are only approximate because of the brittle and shrunken condition of the specimens. They do not agree with the two sets given by De Vis (32 lines = 67·8 mm, 20 lines = 42·3 mm) although J12873 and J12875 are reasonably close to the first De Vis specimen measured. Other measurements given by De Vis have not been compared because it is impossible to determine where they were made.

This discrepancy in size and recently located correspondence between Wallman and the Director of the Queensland Museum on 6th January, 1885, cast doubt on the presumption, based on collection data, that these specimens are De Vis's syntypes although

they were identified by him as *H. irrorata* apparently soon after he had described the species. The correspondence refers to a consignment of specimens and, read in conjunction with the 'Collection Register', shows that the eleven specimens were collected after De Vis described the species and could not be those on which the type description was based. As no trace of the original series can be found, the assumptions of Fry (1912, p. 100) and Copland (1962, p. 61) that the types were lost can now be confirmed.

THE STATUS OF *HYLA IRRORATA*

Five authors have commented on the status of *H. irrorata*. Their opinions, based solely on De Vis's description, are summarised below.

- (i) Boulenger (1885, pp. 386–7) suggested 'comparison' with *H. infrataeniata* (= *H. infrafrenata* Günther, 1867, after Fry, 1912, p. 100.).
- (ii) Fry (1912) examined 'what remain of Mr C. W. De Vis's typical specimens in the Queensland Museum' (p. 97). The *H. irrorata* type material was apparently not sent to him and he assumed it was lost (p. 100). He synonymised *H. irrorata* with *H. caerulea* rather than *H. infrafrenata* although he noted affinity with the latter, including De Vis's description of 'a short line, or series of spots, white' at the angle of the mouth in *H. irrorata*. This was regarded by Fry as characteristic of *H. infrafrenata* but not *H. caerulea*. He regarded colour pattern, position of the vomerine teeth, and distribution of the two species as important, and considered the apparent discrepancy in size of the finger discs as a probable *lapsus calami* by De Vis.
- (iii) Loveridge (1935, pp. 39–40) agreed with Fry and treated both *H. irrorata* and *H. gilleni* Spencer, 1896 as synonyms of *H. caerulea*. *H. gilleni*, a central Australian form, has subsequently been reinstated as a subspecies, *H. caerulea gilleni*, by Copland (1957, pp. 30–31) and Mertens (1964, pp. 15–21, pls. 1–2). The 'short line, or series of spots, white' which confused Fry was present in several of Loveridge's specimens. The discrepancy in size of the finger discs was also noted by Loveridge.
- (iv) Copland (1962, p. 261) followed Fry's assumption regarding the loss of the type series of *H. irrorata* and designated a Queensland Museum specimen, J9255 from Dalby, SEQ., the neotype of *H. irrorata*. After examining this specimen (J9255) Copland (1957, pp. 34–5) treated *H. irrorata* as a separate species, closer to *H. gracilentata* Peters, 1870, than to either *H. caerulea* or *H. infrafrenata*. This opinion was based largely on a comparison of size of the finger discs and percentages of webbing and was reinforced by Copland's consideration of colour patterns and size of tympana. The only discrepancy noted by Copland when comparing De Vis's description with J9255 was in the shape of the head.
- (v) Mertens (1964, pp. 15–16) restated the opinions of Fry and Copland.

The generic name *Litoria* Tschudi (1838) is here used for all Australian and Papuan species formerly referred to *Hyla* following Tyler's proposal (1971, p. 351).

Litoria infrafrenata, with which both Boulenger and Fry considered *L. irrorata* possibly conspecific, may be excluded from further consideration. This species occurs in

TABLE 1: COMPARISON OF THE NEOTYPE OF *H. irrorata* WITH SPECIMENS IDENTIFIED BY DE VIS AS *H. irrorata* AND WITH PUBLISHED DESCRIPTIONS OF *H. irrorata*, *L. gracilentia* AND *L. caerulea*.

Character	J9255	J9255 (after Copland)	<i>L. caerulea</i> (after Copland)	<i>L. gracilentia</i> (after Copland)	<i>H. irrorata</i> (after De Vis)	J12870-80 (identified as <i>H. irrorata</i> by De Vis)
disc of finger 3/tympanum	0.7	0.66	0.75-1.7	>	0.4	0.9-1.0
eye/tympanum	1.5	1.3	1.25-1.5	1.5-1.8	1.33-1.5	1.3-1.5
head breadth/length	1.1	1.0	1.19	1.16	much <	1.14-1.3
% webbing						
right fingers 1-2	27.9	27.0	35.0	64.0	"webbed at base"	24.0-33.8
2-3	32.0	37.0	38.0	67.0		37.0-52.0
3-4	38.6	33.0	38.0-50.0	74.0		32.0-52.0
right toes 1-2	47.4	36.0	52.0	65.0	"toes two-thirds webbed"	48.0-53.4
2-3	46.8	44.0	48.0	83.0		42.0-52.7
3-4	50.0	61.0	61.0	71.0		55.1-68.8
4-5	61.5	61.0	63.0	82.0		58.4-63.4
line or series of spots from angle of mouth	+	+	+	-	+	+
white spots on dorsum and groin	+	(dorsum only)	+	-	+	apparently lost with preservation
canthus rostralis line	-	-	-	+	-	-
forearm shield	-	-	-	+	-	-

only northeastern Queensland and New Guinea (Copland, 1957, pp. 32–3 and Tyler, 1968, pp. 109–110; Queensland Museum, 16 specimens). In all specimens seen by Copland there is a 'wide very prominent, white line which circles the lower jaw and then runs back from the angle to above the shoulder' and this is regarded as diagnostic. Tyler also described this 'conspicuous white stripe'. De Vis described *L. irrorata* from either live or freshly preserved specimens (the syntypes were collected and described in 1884). He does not mention this feature in his detailed description of colour and there is now no trace of any marking on the lower jaws of any of the eleven specimens identified as *L. irrorata* by him.

Examination of the neotype of *L. irrorata* and the eleven specimens identified by De Vis as *L. irrorata* in respect to the features used by Fry, Loveridge and Copland is now possible.

Table 1 compares variation in the disc of the third finger and diameter of the eye in relation to the tympanum; head length and breadth; percentages of webbing on the fingers and toes and colour pattern in *L. gracilentata*, *L. caerulea* (after Copland), De Vis's measurements and description of *L. irrorata*, the eleven specimens identified as *L. irrorata*, by De Vis and the neotype of *L. irrorata*.

Percentages of webbing of the digits have been calculated following Copland (1957, p. 10) and, where possible, his definitions of characters have been used. Where they are not given, those of Tyler (1968, p. 9) have been followed.

De Vis states 'disks two-fifths of the tympanum' in the original description of *L. irrorata*. The disc of the third finger in J12870–80 is almost equal to or equals the tympanum (0.9–1.0). It is impossible to know how and where De Vis made his measurements but such a great difference can not be attributed to changes with preservation. It is possible that De Vis took an average size but this seems unlikely as he does not mention it. The most acceptable explanation is that either the 'two-fifths' of De Vis is a *lapsus calami* as first suggested by Fry (1912, p. 100) or that it is a printer's error and should have been four-fifths, which would be within the range described by Copland for *L. caerulea*.

The vomerine teeth of *L. gracilentata* are 'well separated' and almost always lie between the choanae (Copland, 1957, p. 23). In *L. caerulea* they may be well separated, closely approximated or contiguous and are usually behind the choanae but may extend to the anterior edges of the choanae (p. 28). In the neotype the vomerine teeth are as described by Copland (p. 35)—'. . . well separated, . . . almost but not quite behind choanae'. In ten of the eleven specimens identified by De Vis as *L. irrorata* the vomerine teeth are adjacent and in one (J12870), slightly separated. They lie behind the posterior edges of the choanae in eight and level with them in J12873, J12878, and J12880.

The eleven *L. irrorata* identified by De Vis are within the range which could be expected for *L. caerulea*. Copland described variation in most of these features—size of the disc of the third finger and the eye compared with the tympanum, vomerine teeth, and colour. In the remaining two features for which no variation is described by Copland, (percentages of webbing and head breadth/length) they are much closer to *L. caerulea* than to *L. gracilentata*. They may be definitely excluded from *L. gracilentata* by tympanum size, position of the vomerine teeth, and colour pattern.

In all features considered the neotype of *L. irrorata* is within or very close to the range described for *L. caerulea*. Slight differences are undoubtedly due to its small size and

shrunken and brittle condition which make obtaining measurements with any accuracy impossible. Dr H. G. Cogger of the Australian Museum, Sydney, has recently examined this specimen and considers it to be 'a typical specimen of *caerulea*' (pers. comm.) despite its shrunken condition and the distinct colour pattern which is also present in many Australian Museum and Queensland Museum specimens.

Examination of the eleven *L. irrorata* identified by De Vis and the neotype of *L. irrorata* therefore confirms Fry's opinion that *L. irrorata* (De Vis) is a junior subjective synonym of *Litoria caerulea* (White).

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